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TRANSACTIONS
of
THE NEW YORK ACADEMY OF SCIENCES

SER. II, VOL. 8 MAY, 1946 No. 7

SECTION OF GEOLOGY AND MINERALOGY

APRIL 1, 1946

DOCTOR ALFRED K. SNELGROVE, Visiting Professor of Geology, Rutgers University, New Brunswick, N. J.: *Some Problems of Newfoundland Geology.* (This lecture was illustrated by lantern slides and motion pictures.)

Geologically, the island of Newfoundland is an extension of the New England-Acadian Division of the Appalachian Highlands. It exhibits areally limited relations with the pre-Cambrian Shield of Canada. The rather complete Paleozoic record is of special interest for its European, as well as for its North American, affinities.

Among the problems discussed by the speaker, to the accompaniment of a motion picture tour of the island, were:

(1) The delimitation of the submarine Ordovician iron ore basin at Wabana, and the possible application of geophysics thereto;

(2) The origin of epithermal deposits of lead, zinc, fluorspar, celestite, etc., in country rocks, of pre-Cambrian or Paleozoic age, on the south and west coasts of the island;

(3) The genetic relationships of base metal deposits in the central mineral belt of the island; and

(4) Paleoclimatic conditions, in respect to the accumulation of evaporites and mineral fuels in this part of Greater Acadia.

The potentially important Huronian iron ore deposits of Newfoundland Labrador, and the magnificent Grand Falls of the Hamilton River, were also depicted and discussed.

TRANSACTIONS of The New York Academy of Sciences, Series II, Volume 8, No. 7, May, 1946.
This publication is distributed to Members and is published monthly from November to June, inclusive, at 109 West Chestnut Street, Lancaster, Pa., by The New York Academy of Sciences, Seventy-ninth Street and Central Park West, New York City.
Editor: Roy Waldo Miner.
Assistant Editors: Michael Demarest, Lothar N. Salin.
Executive Secretary: Eunice Thomas Miner.
Entered as second-class matter December 2, 1938, at the post office at Lancaster, Pa., under the act of August 24, 1912.

SECTION OF BIOLOGY

APRIL 8, 1946

DOCTOR CHARLES O. WARREN, Assistant Professor of Physiology and Anatomy, Cornell University Medical College, New York, N. Y.: *Tissue Metabolism Studies on Bone Marrow.** (This lecture was illustrated by lantern slides.)

Bone marrow, the site of production of both red and white blood cells, is one of the few tissues of the adult organism that exhibit active growth and multiplication of cells. Metabolic studies of this organ are, consequently, of general interest in connection with problems of normal and abnormal cellular growth. We have employed the Warburg microrespiration technique to investigate certain aspects of the metabolism of bone marrow cells, supplementing chemical and metabolic studies of other investigators.[1-8] It is the purpose of this report to summarize some of the results.

In most of the experiments, the marrow samples were slices or suspensions of rabbit femoral and tibial marrow. Human material was also used; human rib-marrow has been found to show the same general metabolic features as rabbit marrow, and experiments with human leukemic cells will be cited. Details of the experimental techniques may be found in the publications referred to; but it should be pointed out that the duration of the experiments is a matter of a few hours, rather than of days. The tissue survives well during this period; the cells maintain their staining characteristics, and the motile myeloid cells continue their amoeboid activity. The procedure must not, however, be confused with tissue culture methods.

I. THE RELATIONSHIP BETWEEN RESPIRATION, GLYCOLYSIS, AND THE CELLULAR COMPOSITION OF THE MARROW

Bone marrow consists of a mixture of red blood cell precursors (erythroid cells) and white cell precursors (myeloid cells) in various proportions, in addition to a large and variable complement of fat cells.

* This work has been generously supported by grants from the John and Mary R. Markle Foundation.

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Metabolic measurements have, accordingly, to deal with this heterogeneity of the experimental material. The variable influence of the fat content is eliminated by expressing the results in terms of fat-free dry weight of tissue, which may be conveniently calculated from nitrogen analyses.[4] In experiments designed to determine the effect of the varying proportions of the erythroid to the myeloid cells,[9] the relative numbers of these cells were varied over a wide range by subjecting the animals to suitable experimental procedures. In this way, it was possible to arrive at estimates of the rates of respiration and glycolysis (lactic acid formation) for the separate myeloid and erythroid components of the marrow. It was found that the erythroid cells are characterized metabolically by a relative predominance of respiratory over glycolytic processes, while the reverse is true of the myeloid cells. The active glycolytic mechanisms in the latter are transmitted to their mature daughter cells, the polymorphonuclear leucocytes,[10] for which this metabolic feature is a physiological asset, permitting them to secure energy for their life processes under the relatively anoxic circumstances to which they are frequently submitted, in their wanderings throughout the organism. On the other hand, it is difficult to understand how the relative inactivity of the glycolytic mechanisms and, hence, a dependence on respiratory processes can be other than a disadvantage to the erythroid cells, which, nevertheless, manage not only to survive under conditions of oxygen want, but even to respond to this situation by increased growth and multiplication. This problem was further investigated in the studies now to be described.

II. The Influence of Oxygen Tension on Marrow Metabolism

It has long been known that exposure to conditions of lowered oxygen tension produces a polycythemia, which is the result of an increase in growth and division of the erythroid cells in the marrow. The metabolic basis of this enhanced growth of the red-cell precursors in the marrow, however, is far from clear. Some interesting experiments of Schultze[6] have shown that the cytochrome oxidase activity of rat bone marrow is increased markedly by exposing the animals, for 48 hours, to lowered oxygen tension. Unfortunately, however, no histological examinations were made, so that it is not possible to determine whether the increased enzyme activity is due to replacement of fat by erythroid tissue, to a higher enzyme content of the erythroid as com-

pared to the myeloid tissue, or to an increased enzyme content of the individual erythroid cells.

We have endeavored to ascertain the total energy available to the erythroid cells under conditions of lowered oxygen tension. When bone marrow is exposed to lowered oxygen tension *in vitro,* respiration is not increased; but, at very low levels of oxygen tension, glycolysis is increased.[11-13] This increase, however, is accompanied by a *decrease* in respiration. Since respiration yields more energy than glycolysis, the total energy available to the cells is less than under conditions of normal oxygen tension. This seems to indicate that the erythroid cells, under conditions of lowered oxygen tension, utilize a larger fraction of their total metabolic energy for synthetic processes, *i.e.* growth. How this is accomplished is not known, but changes in phosphate metabolism may be implicated.[14]

These considerations apply to experiments in which bone marrow is exposed to lowered oxygen tension *in vitro.* When the experiment is performed *in vivo, i.e.,* when the intact animal is subjected to these conditions and the marrow is removed for metabolic studies,[11] there is no evidence that the glycolytic components of enzyme systems are increased as the result of formation of erythroid cells under the influence of lowered oxygen tension. Respiration is higher than in marrows of normal animals, but this is apparently due to the higher proportion of erythroid cells in these marrows. In short, the metabolic studies offer no support for the view that lowered oxygen tension stimulates growth of erythroid cells by acting *directly* on the marrow. This widely-held concept may be true, but, in our opinion, convincing evidence to support it has not been brought forward.

III. Bone Marrow Metabolism in Relation to Tumor Metabolism

In the course of these studies, it became apparent that the respiratory and glycolytic metabolism of the myeloid (but not the erythroid) cells of bone marrow in many respects resembles that considered to be characteristic of malignant tumor cells. Further investigations were then made,[15] and it was found that the myeloid cells fulfilled 8 out of 9 criteria[16] generally accepted as indicative of a tumor type of metabolism. Furthermore, the one criterion upon which they are found to fall into the normal rather than the malignant group of tissues, namely, their relatively high respiratory quotient, is the least dependable char-

acteristic of the nine enumerated, low respiratory quotients being by no means a universal attribute of tumor cells. The resemblance between the respiratory and glycolytic metabolism of normal myeloid and tumor cells is, then, particularly striking. It is especially notable that, although both the erythroid and myeloid cells are actively growing cells in the adult organism, only the myeloid cells show malignant transformation (leukemia). The corresponding malignant disease of the erythroid cells (erythroleukosis) is a rare disease in certain animals, notably in fowl; it is virtually unknown in man.

It would appear, therefore, that the myeloid cells may be predisposed to malignant transformation by reason of the close resemblance of their normal metabolism to that of a tumor type. This observation, in turn, adds weight to the concept that there is, indeed, an important relationship between the respiratory and glycolytic activity of cells and their malignant potentialities.

IV. The Action of Certain Drugs

Potassium arsenite was studied[17] because of its clinical use in the treatment of myeloid leukemia in man. It was found to induce a marked depression in the rate of respiration of normal and leukemic myeloid cells, and a secondary or consequent increase in aerobic glycolysis. However, the drug also affected various other normal tissues in essentially the same way, and given concentrations of the drug depressed the respiration of normal and leukemic cells to virtually the same extent. In order to account for the greater susceptibility of the leukemic cells *in vivo*, one must, therefore, conclude: either, that these malignant cells are less able to withstand a given depression of respiration, or, that the effect on respiration is not the essential feature of the drug action.

Thiouracil, another drug investigated, is now being widely used clinically, in the treatment of hyperthyroidism. Unfortunately, an occasional individual, during a carefully supervised course of treatment, may suddenly develop a serious leucopenia or even a fatal agranulocytosis, due, apparently, to a toxic effect of the drug on the bone marrow. It was, therefore, of interest to determine whether thiouracil influences the metabolism of rabbit bone marrow *in vitro*. It was found[18] that thiouracil does, indeed, have a direct depressant effect on the marrow respiration, and particularly on the myeloid cells of the marrow. It

was necessary to employ high concentrations of the drug (100 mg. %) in order to demonstrate this action, but Williams and his co-workers[19] have found that, in the bone marrow of patients receiving the drug, concentrations of a similar order of magnitude may be reached. Pyridoxine, which has been used clinically to counteract the effect of thiouracil on the marrow, is without demonstrable protective action *in vitro*. It is suggested, however, that these methods might be employed to test new chemotherapeutic agents for possible toxic effects on the marrow; also, to test the action of compounds proposed to protect the marrow from the depressant effects of drugs.

V. The Influence of Serum on Marrow Respiration and Glycolysis

Early in the course of these studies,[20] it was observed that marrow respiration and glycolysis are nearly twice as rapid when serum, rather than the usual Ringer solution, is used as the suspension medium. This action of serum has been noted in the case of several other tissues,[21] but, with marrow, the effect is particularly striking. Contrary to what might be anticipated *a priori*, the serum proteins appear to play a minor role, for protein-free ultrafiltrates of serum are very nearly as effective as serum itself.[22] When the ultrafiltrate is further fractionated, more than half its activity in sustaining marrow respiration is found to be attributable to its content of bicarbonate ions, or to the CO_2 with which the bicarbonate is in equilibrium. Other authors, employing carbon isotopes, have recently demonstrated that metabolic fixation of CO_2 occurs in certain organs of the body, notably in the liver.[23, 24] We find that bicarbonate-CO_2 enhances liver as well as marrow respiration.[22] It is quite possible that, in both sites, the effect on respiration is associated with a metabolic fixation of CO_2.

When freed of bicarbonate-CO_2, serum ultrafiltrate still induces a rate of respiration in marrow and liver that is 25 to 35 per cent higher than in Ringer-glucose solution. The nature of the substances responsible for this residual activity, which may well be preferred substrates for marrow metabolism, is currently under investigation. The evidence, to date, points to their fatty acid nature. There is, however, little information yet available as to what foodstuffs (sugars, amino acids, and fatty acids) are preferentially utilized by the marrow, and it is particularly in this direction that our inquiries are being continued.

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SECTION OF PSYCHOLOGY

April 15, 1946

Doctor Richard H. Hoffmann, New York, N. Y.: *Psychosomatic Medicine.*

I have chosen the subject of "Psychosomatic Medicine" merely because the word itself is newly minted from dies cut in the time of Hippocrates. In my opinion, the greatest achievement of human thinking, after the impulse of the 'missing link' to strive toward *homo sapiens*, has been the recently proven concept of the essential identity of matter and energy.

The little sister of this Gargantuan discovery has been the slow birth of the idea that body and mind are not separate and discriminate entities abiding in their human host, but that they are kindred expressions of Life answering the laws of Nature.

It has become an axiom among biologists that, in every cell, there exists a primitive consciousness, a sentient protoplasm dedicated to a purpose. That cell developed into an organism of more complicated structure. Gradually there were created, through need, higher centers destined to control and preside over the ever-growing number of impulses and reactions complicating the life of that organism.

Behind all this was the instinct for survival, through which there slowly developed from primitive protoplasm a nervous system that progressed from a ganglian cell to a spinal cord, to a medulla, to a midbrain, and, eventually, to a neopallium. Then came that inexplicable force that we call consciousness and thought, amplified to the point of achieving the knowledge which taught scientists to split the atom. We have also been given the insight to discover that we are a mass of instincts and emotions which, in our higher integration, are subservient to our reason, the distillate of what Dr. Frederick Tilney called the 'master organ of life,' the human brain.

I shall mention only in passing the attempts that have been made to solve the riddle of human consciousness. The approach has been materialistic, mystical, philosophic, behavioristic, biochemical, analytical, and even spiritual. I prefer to look upon the individual, "in conflict with Fortune in men's eyes," from a synthetic standpoint, utilizing every avenue of inquiry, and applying to him the fruits of whatever talent and experience I possess.

Very early in my medical career, after an interneship in one of our most scientifically dedicated hospitals, I found that the rules and methods leading to diagnosis were far from fulfilling the aim of the healer.

A patient of mine, who was a veritable museum of pathology, an encyclopedia of complaint, was going from bad to worse, under my most assiduous ministrations. It was only when I discovered that she planned to marry a pickpocket and might easily have been implicated that I stopped all treatment, and warned her to give up her plans and beware of quicksands upon which she was about to build her home. The patient returned in three months in the very prime of health. I asked her who had cured her, and what had been her malady. She answered, "No one cured me. I broke my engagement. My fiancé is in jail."

From this case, I learned very early in my career that, while I thought I knew a great deal about medicine, I knew very little about the human being. More than thirty years ago, I felt that, in the field of so-called psychiatry, which, at that time, was considered to be the treatment for the insane, I would find the causes of many ills which not only the spirit, but also the flesh, was heir to. There were, however, four horses to the psychiatrist's chariot, driving him to the Revelation—the physical, the chemical, the psychical, and the spiritual. He must not, however, lose his sense of awareness to disease due to infection, trauma, and neoplasm.

Whether a patient complains of physical or mental discomfort, or both; whether his malady be determined as primarily due to tissue change, glandular dysfunction, allergy, emotional instability, habit insult, or inability to fulfill the primary aim of life—to see a goal and progress towards its attainment; we shall find, upon careful inquiry, that, somewhere in the realm of the psyche, there has been an underdevelopment, or an arrest, or a frustration, or a defeat, which has made it impossible for the individual to accommodate himself comfortably to his environment.

"Blessed are those whose blood and judgment are so well commingled that they are not a pipe for Fortune's finger to sound what stop she choose."

We usually see the people who, at some time in life, have been the objects of its processes, rather than subjects who create them. As a result of this conflict, there ensues fatigue. By fatigue, I do not mean

tired muscles. I mean a chemical fatigue in which the necessary fuels that keep the organisms burning adequately are exhausted, spent, or distributed to the wrong ovens. Out of this fatigue is bred apprehension, and continued apprehension fathers distortion.

Two major conflicts beset life: one is something you want and cannot get; the other is something you have and cannot get rid of. In this conflict, the patient falls back from civilized adjustment to primitive mechanisms of thinking and feeling. First came the word. It is over a bridge of words that we lead our patient from dislocated organization back to adequate function. These patients come reminding us of light-struck plates, incapable of taking impressions. They must be resensitized before they can be exposed to their objective lives. That is why the psychiatrist must be an internist and a biologist. If he disregards physiological disproportions and endeavors to constrain his patient to only one method of investigation and therapy, he will find himself like an Icarus, soaring on wings of wax.

The careful psychiatrist has learned that many maladies arise in people who try to fit square pegs into round holes, and insist upon success. Whatever the protest may be, whatever organ may cry out in pain or passion against the injustices of life, it behooves the psychiatrist to ferret out from the history of the patient, from his birth to the time of his appearance, the hurdles that he either had to avoid or knock down in order to keep in the race. Often, it is necessary to educate our patients to an understanding of our interpretation of their problems. I usually draw a pattern in which I symbolize the concept by a triangle, the idea by a square, and the act by a star. I show him that, as he goes from one to another, the stream of energy is directed by currents of reason and emotion. I try to convince him that the adult travels this path led by reason; that the stultified individual—the one who is subadult—follows an infantile pattern dominated by his emotions. I then draw a tripod and label the stanchions "Security, Loyalty, and Love." I try to prove to him that he has superimposed a primitive upon a civilized pattern of existence; that his way to survival is through security; that, without it, neither love, nor loyalty, can play an adequate part in the drama of life. I then explain that loyalty or honesty is a policy and that it is not indigenous to the untrammeled primitive cell, or primitive man! Experience has taught his forefather that, although it was against his nature not to take what he wanted, it was good policy to treat his neighbor as he himself would like to be treated, and thus

avoid the battles born out of revenge and spite. He is made to realize that the history of civilization is the history of the harnessing of our predatory instincts.

Finally, we come to the discussion of love. Just as it has been said that, in the name of the Prince of Peace, more wars have been fought than in the name of Satan and all of his ilk, so, in the name of love, there have been more battles fought among its pensioners than have been waged in the name of all the imps of the cosmos. Here in the sphere of the 'pangs of despis'd love,' we see numberless moods of strife and discord that are born in the spirit of men, reflecting its despondencies in innumerable manifestations of disease.

The Lange-James Theory of the Interpretation of Fear can be applied to any distortion that makes its inroads upon the serenity of human choice. The discord produces a visceral protest, discomfort; the mind becomes aware of the discomfort and reacts to it with fear and apprehension, producing, literally, a new disease.

It would be a wonderful thing if we could take the 'buffets and rewards of Fortune' without disturbing our sympathetic nervous system. Then we could avoid tension and spasm, secretory change, imbalance, and, eventually, organic disease. But the swallowed sigh, having been born in the heart and imprisoned in the stomach, may eventually produce an ulcer. The cure of that ulcer does not lie in local treatment. True enough, with rest and diet and drugs, the ulcer will heal. However, the pain in the heart must be removed to prevent its recurrence.

I may have given stress to the chauvinistic conclusion that, among physicians, the psychiatrist is the portrait-painter. If I were to admit a sub-group, the psychoanalyst, I would call him the caricaturist. The physician, in the ordinary sense, is a photographer. He gets a likeness of his patient by making his necessary scientific exposures and eventually deciding upon the one he likes best, labeling it, and treating the label. The psychiatrist, on the other hand, becomes intimately acquainted with his patient. He sees him as a child, as an adolescent, as an adult. He watches his mood, he sees his relation to time and space, and when he has memorized his personality, he puts him on the platform, and using the brushes and colors of insight and understanding, creates a true portrait which has the likeness not only of the without, but of the within, and reflects the character and disposition of the sitter.

SECTION OF ANTHROPOLOGY

APRIL 22, 1946

MR. PAUL S. WINGERT, Department of Fine Arts, Columbia University, New York, N. Y.: *Art and Its Function in the New Hebrides.* (This lecture was illustrated by lantern slides.)

(No abstract of this paper has been received.)

MR. CARL WITHERS, Brooklyn College, Brooklyn, N. Y.: *The Folklore of a Small Town.**

Although the assigned topic indicates a wider scope, I shall attempt to discuss only the medical folklore of a small midwestern community which I have pseudonymously described elsewhere, in more general anthropological terms. A book-length treatment of its folklore, including the more usual folkloristic categories, is in preparation.

The community will, in this present paper, be called Smalltown. The population of Smalltown is slightly under three hundred, and it is the local trading center for about two hundred farms which lie on a small prairie surrounding the village, and in the nearby hills.

In Smalltown, there are five historical layers of medical and pseudo-medical lore, all of which coexist and have coexisted, in varying ratios, for a long time. They are, in a kind of rough-and-ready historical order of appearance: (1) Early magical practice, including both "witchcraft" and divine healing; (2) an enormous body of "home remedies"; (3) rational or pseudo-rational medicine connected with the recognized medical profession; (4) patent medicines; and (5) a new and recent wave of curing by prayer and other religious techniques.

Old men and women now[1] in their seventies say that, when they were children, "the woods were full of witches." Most witches were women; a few were men, though the word, when applied to a man, usually meant only a "water witch" or dowser, who with a forked stick could locate underground "streams" of water. A few witches had power to harm with ill-luck, sickness, even death. Most were benign, however, serving as "granny women" (midwives), sick-bed nurses, and respected repositories of the lore of home remedies. Women who practiced these arts were not necessarily witches, but most granny women were. Midwifery was a semi-specialized profession.

A granny woman was in particular demand, not only if she had practical command of childbed techniques (some of these were magical: for example, she should know enough to burn cobs under the bed when parturition was difficult), but also if she knew spells to ease pain, could stop blood from flowing by murmuring a Bible verse or magic rhyme, could remove warts with spit or string or words, and

* This address was delivered at the meeting of the Section of Anthropology, March 25, 1946.
[1] "Now" means 1939–40, when fieldwork was done.

knew charms or devices to catch reluctant lovers or to repel undesired ones.

Many people, other than witches, knew and practiced various magical charms, some of which are still used. I imagine that no one any longer tries to capture a sweetheart by stealing a bow off his hatband, by dropping a toenail clipping into his drink, or by baking a drop of menstrual blood in his cake. The first two are still often laughingly mentioned, though it is "indecent" to speak of the third. However, everyone knows several magical methods of removing warts and tells of occasions when they *worked*. The old-time witch simply knew more magical tricks than the average layman, and her prestige hinged on her store of knowledge in all medical and magical situations. Many witches could also see or communicate with ghosts, interpret dreams, or tell fortunes from cards, tea leaves, coffee grounds, or a bottle of whiskey used as a crystal. Some had second sight. These knew instantly when a distant house or haystack caught fire, and when far-off relatives suffered injury, sickness, or death. All these powers, taken together with a tremendous system of omens, tokens, and signs, related to human health and well-being.

Except for one famous local story, only a few scraps of evil witchcraft are any longer remembered. One way to harm people used to be to leave a "pully bone"—a chicken's wishbone—on the doorstep of an enemy. If he stepped on the bone, he suffered whatever harm had been wished against him. About thirty years ago, the families in a rural neighborhood who used the same spring grew angry, because a man of the neighborhood kept dropping horsehairs into the water, "to poison people." Presumably, the horsehairs would turn into snakes, a notion which probably a third of the people still believe. Many have tested it out by putting a horsehair into a bottle of water for a week or two, and most have found it to be true!

The community's great story of evil magic occurred in 1897, and terminated in a court trial. A man whose farm adjoined that of his two elderly aunts repeatedly found horsehair ringlets in his house, barn, paths, and even pockets. He finally decided that they were "witching" him and prayed to God for guidance. God appeared to him and told him to kill the witches on a night when the moon dipped three times. For three nights he watched the moon and, on the third night, it dipped low three times. He sharpened his corn knife, crept up to his aunts'

house, and cut the women to pieces. At his trial for murder, he showed a pocketful of horsehair ringlets, but they were not accepted as legal evidence and he received a life term in the penitentiary. In a few years, however, he was paroled to relatives in another state, with whom he lived out the rest of his life peacefully.

There are no longer any witches in Smalltown. Elderly women, however, still serve as midwives, usually as neighborly and unpaid assistants to the attending physician. There are also still a few ghost-seers and "dreamers," mostly in the backwoods, and a large body of signs and omens, which some believe in, some half believe in, and others view with mirth or contempt.

Most of what are locally called "the old-home remedies" are passing into disuse, but enough were reported to fill many pages. Here are a few, together with the names of the ailments for which they were, or are, given. Colds are commonly viewed as "something you just have to wear out," yet there are many old remedies for them. One is to eat honey, because it is made out of wild flowers; another, a tea brewed of field balsam, and sweetened. For coughs, drink hot tea made by boiling mullen leaves and hoarhound, or by boiling shredded hickory bark. ("Hickory tea," in another connection, is a "remedy" applied directly with a hickory switch to the backside of a small boy.) For a sore throat, swallow a teaspoonful of sugar saturated with turpentine or kerosene, or blow dry sulphur into the throat through a paper funnel. A preventive gargle for colds is one quart of boiled rainwater containing a teaspoonful of salt, soda, and carbolic acid; this should be used every morning. Another gargle is vinegar, liberally sprinkled with pepper and salt. Some "old-style" farmers and town people swallow skunk oil for colds, though they know that most of their neighbors laugh at this remedy. Skunk oil is also taken internally for "croup," dropped into the ear to stop earache, rubbed on the chest for a chest cold, and applied externally to any part of the body beneath which there is a pain or "information" (inflammation).

To cure colic in her seven-day-old baby, one young mother administered sulphur soaked with the juice of a baked onion. An elderly neighbor had suggested, instead, two teaspoonfuls of boiled catnip juice with sugar. Calamus root tea is occasionally given for "cramp colic"; the boiled juice of rhubarb root, for "stomach cramps"; spice tea, for

"the stomach ache." For "a rising in the bowels,"[2] one old woman recommended a hop-tea poultice, made of the boiled cones. "A fine remedy for the flux or summer complaint," she said, "is mules'-tail tea." Mules'-tail is the native name of a plant. An old man said, "We don't *never* go to a doctor for summer complaint. We just bile witch hazel bark or the sticks, either one, and drink the juice. It's a *cure* for people or hogs that's got the scours." He cures styes by applying castor oil, though his father's remedy was "weak terbacker ooze"; "the seven year eetch," by boiling polk root and rubbing it on. This remedy he described as "from a way back" and severe—"It'll raise up big welts . . . but hit'll sure cure the eetch."

An old couple living in town have cured hives with (1) saffron tea, (2) an onion bandage, or (3) a peppermint poultice. The old man has cured himself three times of "blood boils" by drinking burdock-root tea. With this treatment, in 1901, he cured himself of a series of twenty-five boils on his neck. His wife has cured shingles with soda and with catnip tea, applied to the rash; but the best remedy, she said, is to "cut off a black cat's tail—or a black chicken's tail will do—and let it bleed over the sores." She cured her husband, using a black chicken, in 1931.

She, at least, does not think of this treatment as magical, but just as an old-time home remedy that works. In her childhood, "everybody" took sulphur and molasses, each spring, to thin the blood. The practice was to take a dose on three successive mornings, miss three days, and so on, until nine doses were taken. In her childhood, also, she said, though nobody else mentioned this, scarification was widely

[2] There are scores of curious local names for illnesses, for example: "risings" in the head, stomach, leg, or any other member; "asthmy" of the windpipe or stomach; "information" of almost any part of the body, including internal organs; "congestions"; "nerve trouble"; "female complaint"; kidney, liver, stomach, or heart "trouble"; "slow" or "quick" (sometimes called "galloping") "consumption"; etc., etc.

Some diseases are considered to be "imaginary" or to rest only "in the mind." Most sufferers are said to be women. The main causes are "a nervous disposition" or "brooding" (perhaps over a headstrong child or sinful husband or a recent death in the family) or from "thinking about one's self too much." Such a disease may have or lack organic symptoms. The "worst" mental disease is, of course, insanity. There are two kinds of insanity, the "harmless" kind and the "violent" kind, and the former gains much more sympathy for its victim than the latter. The wife of a leading citizen was insane while I was in Smalltown. She was not considered really dangerous, but her outbursts of extremely frank talk embarrassed people. Her illness was almost universally attributed to her having washed clothes while menstruating, yet a good many people thought that she was no crazier than she wanted to be. I rather often heard insanity described as voluntary. "Brooding over religion" is probably the commonest cause of insanity in Smalltown; a number of past suicides were by people who "went crazy over religion." The insanity of a middle-aged man now "in the asylum" was explained as follows: When he was a boy and his mother wanted to punish him, she used to seize him by the heels and dangle him over a well. "She done that a lot when he wouldn't mind her, and that always did seem to bother him a little and prey on his mind." To have kinfolks in the asylum is somewhat disgraceful, and to have "insane blood in the family" is a fearful thing.

practiced. "My older sisters," she said, "didn't have an inch of skin on their shoulders that wasn't welts." To thin the blood in spring, or for agues, bitters were taken until recently—"a big swaller every morning before breakfast." Bitters were made of "sour sassaprilly," "yellow pecoon," ginseng, wild cherry bark, and snakeroot, boiled to a tea to which whiskey was added. Sassafras tea is still taken to thin the blood.

A farm boy in high school mentioned with ridicule all of the following remedies and said they were "still in use": putting a spider web on a wound to stop bleeding; applying salt to a cut to heal it; smoking coffee for toothache; a quid of tobacco on an aching tooth; a tobacco quid on a baby's stomach to cure "worms"; pumpkin seed tea for "stomach worms"; salt and vinegar poultices on the back for kidney trouble; gunpowder and cream ointment for ringworm; canning acid and pine tar salve for eczema; nicotine from a pipe for eczema; golden seal for sores in the mouth; applications of cow dung tied in a white flour sack to mump-swollen testes to draw out the swelling (cow dung is also sometimes used as a face bleach); application of a mixture of coal tar, turpentine, and camphor to the right side to cure appendicitis; and carrying a buckeye or a lump of sulphur in the pocket to cure or prevent rheumatism. In a forthcoming book called *Ozark Superstitions*, Vance Randolph mentions a respected Ozark physician who carries a buckeye for rheumatism, on the basis that it *can't* do any harm and *might* help. Patent medicine is, for the most part, a commercial development from the recognized medical profession, but, since its main use has always been to by-pass doctors and their fees, it is best treated in connection with home remedies. The main difference, in local eyes, is that home-prepared remedies are made from materials that "*we* know," while patent medicines are prepared from formulae that "city doctors and manufacturers know."

Patent medicine came into great favor at least forty to fifty years ago, although this seems also to have been the period of greatest rivalry between all methods of curing; through witches (specialists in both magical formulae and home remedies); through a far wider parental knowledge of home remedies than at present; through patent medicines of various kinds; and through regular physicians. There were over a dozen physicians in the county in 1900. In 1940, there were only three, only one of them active. Whether sickness has diminished during the

same period, I do not know. Some oldsters say, "There wasn't no sickness around when I was a child." Others say, "In them days ever'body was *down* half the time." Medical records were wholly lacking until recent years and are still inadequate. Malaria does seem to have been very prevalent until recent years, and typhoid fever a scourge every summer. Undoubtedly, there were also more frequent epidemics of such diseases as whooping cough, measles, mumps, scarlet fever, smallpox, and diphtheria.

A type of patent medicine, no longer sold, was the universal nostrum. A dozen curealls were advertised in the county forty years ago, as curing anything from piles to "consumption." Other patent medicines were more modestly claimed to cure only piles *or* consumption, or female complaints, or nervous disorders, or rheumatism and lumbago, or diseases of the stomach, kidneys, liver, and bowels. Numerous patented tonics, salves, liniments, and physic pills were on the market. At picnics and carnivals, barkers sold the panacea "bear grease" and various potions and lotions in bottles, powders, salves, and pills. The labels on many packaged remedies bore the names of doctors and thus carried the aura of the medical profession. Perhaps some of these doctors were imaginary. Some were, of course, authentic medical doctors who were willing to lend their name to products which promised to harvest dollars from the sick and gullible, and the public had even less legal protection from charlatans than it has today.

In the average Smalltown kitchen, there is a shelf on which sits the family's staple supply of "boughten" home remedies.[3] Not all of these are patent medicines. They generally include, minimally, palliatives like aspirin and vaseline; a widely advertised mentholated salve (used in various ways for colds); turpentine (for liniment and antiseptic); and one or more varieties of patented physic pills. Most families have also a supply of epsom salts, castor oil, and calomel. Regular bowel movements are highly valued, and both children and adults are dosed with physic at bedtime after any day of "irregularity." Probably most old people take a physic daily, sometimes five or six times the dosage recommended on the package. Whatever other patent medicines are bought are usually purchased for specific or chronic ailments,

[3] A clock generally sits there too, and often, on nails beneath the shelf, hang a number of almanacs, which are distributed free through local merchants by various patent medicine firms. In addition to advertising matter, these booklets include a calendar, detailed weather forecasts for the year, and information about the sodiacal signs and moon changes, on which a great deal of local agricultural magic is based.

like stomach trouble, nervousness, fatigue, etc. The customer decides, after comparing symptoms with neighbors, or after consultation with a physician, what his illness is, hears radio advertising, reads ads in patent medicine almanacs and newspapers, examines labels on packages in the drugstore, consults druggists and friends, and shops around, trying out this or that packaged remedy, until he finds something that "seems to help," or until his ailment abates. The supplies on the medicine shelf are the present-day basic body of "home remedies," having largely supplanted the older home remedies described earlier, which were in addition homemade, mainly of leaves, roots, and barks found in the local woods. They are usually administered without the advice of a doctor. Doctors and other health officers of the region in general rather weakly sanction their use, though condemning their "abuse."

When children or adults become ill, home diagnosis and home treatment are generally tried first. Home diagnosis of the child, the husband, or of herself, is usually done by the wife, though some men are also "good in sickness," which means good in diagnosis, treatment, and "care." The five primary diagnostic points are these: (1) Testing the sick person's brow with the back of the hand for fever. If the brow feels much hotter than the hand, the patient is "feverish." (2) Examining the tongue to see if it is coated. (3) Asking, "When did your bowels move last?" (4) Asking, "Does your head ache?" And (5) asking, "Do you hurt anywhere else?" A child, who may have been "piecing" from the cupboard or eating wild or tame fruits gathered outdoors, is also asked, "What did you eat?" Except for colds and children's epidemics, most illness is at first diagnosed as due either to constipation or an upset stomach, and a physic is taken or prescribed. The "severe" physics, epsom salts, castor oil, and calomel, are dreaded and hated by children, the first two for their evil taste, and calomel because children cannot eat anything sweet or sour for some time after taking it or they will be "salivated"; that is, their teeth will come out in a horrible manner which will leave gaping holes in their cheeks. These physics are administered to children partly as medicine, partly as punishment, for eating things they knew they shouldn't, like green apples or too many wild cherries or raw turnips or sweets.

An old country proverb goes: "When home remedies fail, try a doctor." There is one aged physician in the community, whose tech-

niques are presumably similar to those of other rural practitioners of his generation—perhaps better, since his son, with whom he is on extremely intimate terms, is a respected physician in the regional metropolis, a city of 60,000, sixty-five miles away. There is also a young osteopath in another town in the county.[4] There seems to be no great local recognition of the differences between the two types of skill and training. People select between the two on the basis of past experience, the comparative age and "modernity" of the two men, and out of a whole welter of hearsay and comparisons of cases of "kill" and of "cure."

Other general practitioners are consulted in nearby county seat towns, but since home call rates are based on mileage, they are too expensive for ordinary home calls. Beyond the immediate area is the regional metropolis, where people go to consult specialists, for hospitalization, for major operations, and for some minor ones. Emergency cases, for example, of acute appendicitis, or what is diagnosed as such, are rushed there in the local undertaker's ambulance.

There are also a few "radio doctors" and "mail order doctors" who advertise in the press, whom some people patronize. The local jeweler and tinker has "got more good" from one of these, with whom he is in correspondence, than from all the "regular doctors." He claims to have spent, in earlier years, thousands of dollars with physicians, whom he calls "butchers and thieves." His mail order doctor denounces all drugs, and prescribes foods, particularly melons, prunes, bran, and mineral oil as medicines. For the notorious "goat gland doctor" Brinkley, whose broadcasts from Kansas were terminated by law, there was about as much sympathy as condemnation, and some people still listened to him broadcast from Mexico. A cancer hospital in the state, which "cures without operations," carries on local propaganda, and it is well thought of. Some people "swear by" chiropractors, though there is no chiropractor nearby.

Beyond all these regional services is the world of "big city doctors," which everybody has heard of, though none has patronized. People have heard of doctors who "charge you $100, just to see if your tongue is coated." Some have read of psychiatrists and other "mind

[4] Since my study was made, in 1939–40, the old doctor has retired and been supplanted by another osteopath, and a third osteopath has come to the county seat. A large college of osteopathy in the state is pursuing a very successful program of training young men and encouraging them to locate in the numerous small towns of the state, which no longer attract M.D.'s.

doctors." One young man in the community, otherwise highly respected, is a peeper. He has been known to peep through the bedroom window of two girl cousins. Since this is a family matter, he has gotten into no serious trouble, but a neighbor took the locally unusual view that this young man was "sick and couldn't help his peeping"—and really should consult "one of them city sakitrusts."

Another medical resource that should be mentioned is the District Health Office, fifty miles away and covering five counties. This is a partly fact-finding, partly educational and steering service. In fact-finding, according to a District Nurse, "We have just barely scratched the surface in this county." She hazarded the very tentative and undoubtedly exaggerated guess that *all* the children were rachitic and that ten per cent were tubercular. Her office had no information on whether there was any trachoma or undulant fever in the county, though it is in a region where both have a rather high incidence. As a reform service, the District Health Office works through such agencies as the county relief office, the county agricultural agent, the home economics demonstration agent, and vocational agriculture teachers. No citizen ever visits the office directly, though patients unable to pay are sometimes routed by it to clinics and to state hospitals.

The one dentist in the county provides probably more than half of the professional dental care received by the county's six thousand citizens. The rest that is done, is done by dentists in adjoining counties. A small group of adults try to keep in repair their own teeth and their children's "second" teeth. Milk teeth are not worth spending money on. The rest of the community gets no dental care whatever, except extractions, and usually, at last, false teeth, either fitted by a nearby dentist or bought by mail.[5] Nowadays, most extractions are made by a dentist, but gruesome tales are told of the days when people visited farmer-blacksmiths who pulled teeth with their forge tongs, sometimes just as "an accommodation," sometimes for a small fee. Some adults have been known to pull their own teeth. Those who do not visit a dentist for fillings buy a good many commercial toothache-killers to stuff into the cavities. One man told me that, for a particularly severe toothache, he plunged a red-hot piece of baling wire deep into the

[5] Among people with artificial teeth, there is much talk about how they fit and the "satisfaction" they give or don't give. It was considered odd that a newcomer, the wife of a government employee, never mentioned "her teeth," but seemed embarrassed when told how pretty they were. Old people without teeth, or with just a few teeth, enjoy a good deal of pleasant conversation on such topics as proficiency at "gumming it" or whether they still have two or more teeth that "hit."

cavity. "It hurt like Sam Hill," he said, "but that was the end of my toothache." Extractions, it might be added, seldom come at the same time in the history of a tooth when a city doctor would extract it.

People, in general, think there is not much to be done about dental decay. Either you have good teeth or you don't. Many think that, if you start dental repairs, the dental work itself, particularly cleaning, which, they say, takes off all the enamel, stimulates further decay. They point out that this is to the dentist's financial advantage. Some oldsters say that people used to have better teeth than folks have nowadays, attributing this fact to tobacco chewing, clay pipe smoking, the prevalence of home-grown foods, and many other factors. Some modern ideas are coming in that brushing the teeth prevents decay; that oranges prevent decay; that milk prevents decay.

It is told that, in the old days, a good many old people grew a complete third set of teeth, long after their permanent teeth were gone. At least ten long-since-dead oldtimers are supposed to have done so. A related story is that many old people in the past, after years of fading eyesight, received their "second sight," and for the rest of their lives were able to read their newspapers and Bible (if they knew how to read) or bead their rifles on a squirrel, as in their days of youth.

Before going further into the attitudes toward medical facilities and the extent of their utilization, it may be well to describe the wave of divine healing which has swept one sector of the county in recent years. It is connected with the Holiness Church. No completely faithful member of this organization puts any faith in doctors as curers of disease; though it is all right to use a doctor as a bonesetter or to sew up a cut. Even this should not be *necessary*, however, if your faith is strong enough in God, because He can heal anything. In this whole cult, the widespread popularity of Christian Science, on a relatively high class level, seems to have encouraged and sanctioned the rebirth and expansion of a lower-level and older series of religious superstitions. The Holiness taboo against patent medicines is also rather great, but against old-time home-made remedies there is very little taboo. Apparently, in Holiness theory, these are not "medicines"; they pre-date doctors and drugs, and share none of their evil. An old man, whose wife was a leader in the Holiness congregation, described many old-home remedies, testifying to their efficacy, and he also narrated many cases of cure from prayer. Here are a few: His wife was

down with ulcers; "She couldn't raise herself up and hadn't et for several days; the neighbors said, 'Git a doctor—she cain't live!'" Brother Miller (the preacher) came and prayed over her. She arose fully recovered from her sickbed and ate a big supper. "Now, when you see anything with your own eyes you believe it," said the old man; "I believe in a doctor, too, and I asked the doctor and he said, 'Prayin' cain't do no harm!'" The same man's daughter-in-law got a coffee bean in her windpipe. "The doctor said, 'Operate!' But Brother Miller and others came and prayed and she coughed it right up." At a camp meeting, there was a boy with "paralzy" in one leg. "He was all drawed up—hadn't walked for years. They prayed for him and he straightened right up and walked. Now nobody couldn't doubt that, surely!" A cow hooked the old man's neighbor, Molly, in her arm, tearing the "leaders." The preacher and others gathered for prayer, and Molly suffered no more. The old man himself received a "bad horse-kickin'," a few years back. His life was despaired of, but prayer cured him quickly. " 'Course . . . the Lord don't intend to heal 'em all," said he. "It ain't His will."

In fact, the main pillar of the Holiness Church, a widow, had just died of cancer, though committees from the church met nightly during many months to pray over her, and preachers flocked in from adjoining counties to help. For weeks, in an affiliated church called Pisgah, in far away California, perpetual prayers were said, and, as a ritualistic action, airmail letters were kept constantly en route between Pisgah and Smalltown. I was unable to learn their contents. An anointed handkerchief was sent from Pisgah to lay on her cancerous breast. Non-Holiness people criticized and ridiculed these proceedings, and some said, "She ought to be forced to have a doctor," but no physician saw her. Her death did not weaken her co-religionists' faith in prayer, but was taken as a manifestation of God's will. For her, it was interpreted as a release from earthly suffering into eternal bliss. Other cases were cited, in which it was God's will to cure even cancer. While most religious people in the community believe in the efficacy of prayer in sickness, in encouraging good crops or financial success, and for other matters, most non-Holiness church people consider that its proper medical use is as an adjunct to medication by traditional remedies or by a physician. A man who repeatedly testified in the Methodist Church how God cured his rheumatism at the same time He converted

him from "infidelism and a life-long quest of sin," is officially approved by the preacher, but laughed at privately by many members.

The local physician is usually consulted or called in only in cases of sudden severe illness or injury, or when chronic symptoms of one sort or another have not "worn themselves out" or disappeared after home medication. A deep ax-cut or knife-cut or a shotgun wound is nearly always taken to the doctor for dressing; so is a hand mangled in a piece of farm machinery. Minor cuts or bruises are, of course, handled at home, with or without antiseptic, commercial liniment, poultice, or bandage. If a rusty nail is run into the foot, it may be pulled out with nothing further done; the wound may be soaked in turpentine, iodine, or other antiseptic, at home, and bandaged; or, the patient may be taken to the doctor for treatment and even for anti-tetanus shots.

A broken arm or leg is always set by the doctor. A broken rib or finger is very often allowed to heal of itself. People feel little concern if a broken finger heals crooked or stiff. Almost anyone bitten by a rattler or copperhead would get anti-venom injections from the doctor, though dozens of traditional snakebite remedies are known. These include: liberal dosage with whiskey; soda and onion juice squeezed on the wound; and plunging the bitten finger or toe into the body of a live setting hen, to remain there until the hen dies. There is a madstone in the county. It came from the stomach of a white deer, and old people say "Nobody ever went mad who used that madstone." However, nowadays, anyone bitten by a dog proved to be rabid, takes the Pasteur treatment. The rabidity of the dog is determined by sending its head to state health officers for examination. *Suspicion* regarding rabidity is aroused if the dog is "a stranger," or if he froths at the mouth, or otherwise behaves oddly.

Native attitudes toward recognized physicians and standard medical procedures are a curious hodgepodge of old and new, of suspicious resentment and dependence. Part of this resentment reflects an attitude of suspicion toward science and all its works, including evolution. Part of it comes, of course, from the fact that medicine suggests disease, pain, and ultimate death—subjects which are not very pleasant to think about. People utter proverbial generalizations, like "Doctors don't know anything!" or "With doctors, it's all guesswork." Many natives speak of doctors as callous butchers or, like lawyers, as interested in prolonging a case for what they can get out of it. The finan-

cial motives of most doctors are considered questionable, and sometimes very strange rationalizations are offered. I heard one man deny the existence of "rabbit fever." He had skinned and dressed rabbits all his life without catching anything, and he said all the talk about rabbit fever resulted from a league between the doctors and meat-dealers, to prevent people from eating meat which costs nothing. The highest tribute to a doctor is to say, "I have *faith* in him." The word "faith" here carries a kind of overtone of the sacred, as in the phrases, "faith in God" or "faith in Salvation."

Vaccines and serums of all kinds are viewed with suspicion. Few children are immunized against smallpox, and any movement to introduce compulsory immunization of school children is cried down. Many people say, "The vaccination is worse—and kills more people—than the disease." Others view vaccination as valueless, because its theory, as the theory is locally understood, seems foolish and unreasonable. "To stick dead bugs into you to keep live ones from working on you—now you *know* that's silly!" Still others consider vaccination to be sinful, nor are they all prayer-curers. Yet, if a child has diphtheria, parental anxiety is so great that most parents welcome injections of the serum (a few will refuse!) and speak of its discovery as a great thing.

The urban prestige value of operations has only begun to penetrate Smalltown. A few women are said to "want operations" and to boast of them; and, oddly, people seem rather proud of tonsilectomies for their children. However, in general, surgery is viewed with great fear and horror, and as often useless. Appendectomies, in particular, are thought of as a surgical 'racket.' There are stories of people threatened by a doctor with death, unless they submitted to an appendectomy, but who just took a physic, got well, and stayed well. Others went through the operation only to have the symptoms recur later. In a new operation, the appendix was found intact. The widespread story is told (with local application) that, in one case, a pair of scissors and a wad of gauze were found sewn in beside it. People seem pleased to narrate and to believe such stories.

Hospitals, though beginning to be patronized fairly extensively, are often spoken of as places "where more people come out dead than come out alive."

Physicians themselves help perpetuate this piece of folklore, though the point they intend to make is somewhat different from that

which native critics intend to make. Hospitals, however, are dreaded excessively, and few people go there, except on very serious business. Only one or two Smalltown babies a year are born in hospitals, and it would be almost unthinkable to enter a hospital for diagnosis only. An odd bit of local history or folklore, which many informants mentioned, illustrates how very new cultural traits are often integrated with very old patterns. About fifteen years ago, a man died who, for twenty years or more, had earned a few dollars each year by peddling "The Farmers' Almanac" about the county. He was also an expert in moon signs and zodiacal signs (then even more important than today, in matters of planting, harvesting, girdling trees, building rail fences, shingling houses, castrating livestock, and weaning young animals or babies). When physicians began to prescribe operations, he gained considerable local fame by advising patients whether the sign was wrong or right to have their tonsils or appendix cut out. People say, "He never missed it." If he said the sign was *wrong*, and they went ahead, they always died, or at least had a very hard time of it; but, if he said the sign was *right*, then they knew there would be no danger.

Explanations of health or disease run a very wide gamut. Malaria, once universal, is now practically non-existent, but people still talk about it. What caused it? And what caused it to disappear? Most people accept the fact that infected mosquitoes transmit malaria; but, since there are still mosquitoes, it is hard to understand why malaria slackened, unless it took a greater *number* of bites than people get nowadays to catch malaria. It is said that everybody took a lot of quinine during a good many years, but the *mosquitoes* didn't take any quinine! Some people cling to the early theory that dampness, not mosquitoes, caused the malaria of early days. There were more trees in the river bottoms, and the air was damper. Besides, it *rained* more then, because the soil (now 52 per cent eroded!) produced better crops than it will grow today. Others say that a mosquito may cause malaria, but so may a chigger, a tick, or any other insect that bites. Some people say that mosquitoes must have caused typhoid, once prevalent (people say) every summer. The argument runs: Mosquitoes caused the malaria; typhoid and malaria disappeared at about the same time; therefore, mosquitoes caused the typhoid. Indeed, it is difficult to convince people of any completely credible connection between typhoid and lack of sanitation, because some families drink water out of green-scummed springs, or out of improperly walled and covered wells, and

remain ostensibly hale and hearty. The hotel well stands twenty-five feet from the hotel privy, and slightly downhill from it. I asked the aged proprietor if he had ever had his water tested. "Yes," he said, "a man came through here from the capital and tested it, and he said it was ninety-nine per cent pure. He said that, by rights, I ought to concrete it down about six feet from the top, but I didn't think that was necessary for just that one per cent. *I* never got sick and I never knowed nobody to get sick from drinkin' this water."

The whole problem of reform in sanitation presents many difficulties. People, in general, believe in protection against "germs," though some view germs as "just a superstition of city folks." Separate towels at home, or separate drinking cups at school, are hard to accept, because it is unsociable not to share a towel, and insulting not to want to drink after somebody else. A system of traditional etiquette and courtesy covers all such matters. A district nurse told of families in an adjoining county who were persuaded to construct sanitary privies, but who abandoned them, because "the children like to go together." In certain very old techniques, like dairying, as a matter of fact, some of the old-fashioned people scald and sun their milk vessels carefully and attain a higher level of sanitation than more modern neighbors with cream separators.

Under the stimulus of the agricultural experts, reform has gone further in farming techniques than in medical practice. The current trend is, on the whole, toward cementing and covering wells, clean dairying, and clean poultry yards. Agricultural experts have progressed rather far in introducing techniques which bring profits, even when these involve sanitation.[6] More of the actual reforms in public health, also, have come from them than from medical practitioners, in-

[6] An account of veterinary lore and practice would be interesting, if there were space. Local specialised "curers" are in conflict with the agricultural experts (the nearest veterinarian is too far away to patronise at reasonable cost), who are winning the battle. The chief symbols of resistance to veterinary science are two diseases of cows, "hollow horn" and "losing the cud," which the experts ridicule and the traditionalists angrily defend and treat. Vaccination of animals meets with less resistance than vaccination of children, perhaps, partly, because the animals "have no souls." The main reason is, of course, that animal vaccination is part of a "great trait complex," scientific agriculture, which, for the most part, is being intelligently propagandized. The main traditional symbol of resistance to the whole trait complex of scientific agriculture is the moon. The moon's waning and waxing, together with the sodiacal signs, formerly governed the timing and success of most agricultural pursuits. The sodiacal lore has almost vanished, but fully half the farmers follow the "moon signs" (the "light" and the "dark"), in some or many activities; even more people "believe in the moon" than work by it. New agricultural experts are always quizzed as to "what they think about the moon," and the tactful ones answer evasively. One clever vocational agriculture teacher used to answer the query by saying, "My father always planted his field crops by the moon, but my mother planted her garden any time she thought the soil and weather were ready. And his crops never seemed to do any better than hers." This remark was accepted as perfectly satisfactory.

cluding the regional public health officers. These reforms enter through vocational agriculture classes in the high schools, and through the home economics clubs organized by the county agent, which study nutrition, child care, and sanitation. Active suggestions also come in through home, health, and diet pages in newspapers and magazines. In these, health and prestige values are built up simultaneously. Advertising pages (and radio advertisements), which appeal to people, for prestige and for health, to eat various proprietary foods, probably do more harm than good, for they stimulate people to think of health in terms of single foods. The national enthusiasm for "proper diet" introduces and arouses a new folklore, including many strange and garbled notions: that if people just ate raw foods they would be healthy; that they would be healthy if they ate less meat, or *nothing* but vegetables; that all they need is plenty of vitamins (vitamins tend to be animized, by those who "believe in" them, as little, live, health-giving germs that sit on the edges of cabbage leaves); that oranges, or prunes, or bran, or milk, are the single *sine qua non* of health. I have heard it said that "hog meat causes all the cancers in this country," and that anything out of a tin can will make people sick.

The problem with all folklore is what to make of it. There has been endless collection of old remedies, superstitions, beliefs, legends, riddles, rhymes, proverbs, games, folksongs. Aside from the labors of a number of part-time workers in the field of primitive folklore, the concentration of effort has been on accumulating texts and variants, and on establishing distributions of themes and items. This antiquarian pursuit no longer seems very fruitful or illuminating. Better techniques should be devised to explain the use and meaning of folklore in the social life of the group from which it is collected.

There is, perhaps, one very useful method of dealing with the kind of material presented in this paper. The mixture of ancient and modern fact and fancy which I have called the medical folklore of Smalltown resembles every other aspect of the community life, as I have described it elsewhere. Smalltown is an oldtime hillbilly farming community, in the throes of adjustment to urban influence entering by every device of modern communication: radio, newspapers and magazines, travel, and direct governmental intervention through numerous agencies and facilities. Under the impact of the new, old attitudes are

being abandoned, or reinterpreted, or, as a form of protest, reinforced. This hodgepodge of medical lore well illustrates the nature of the conflict, and of the resultant disorientation. The conflict is, in the main, along class lines and between the generations. Though class is locally denied, there is an upper class of more modern "prairie" farmers and a lower class of "hill" farmers.

New remedies, new foods, new rationalizations regarding medical care and food, disturb the old pattern of "felt security," as the young people, the "better class" people, the new federal employees (the reformers!) condemn, ridicule, and try by a frontal attack to change the ancient way of life. Some people accept the new willingly, but a sense of inferiority and loss comes over most people when they feel disrespect directed toward what they were taught by tradition. Some attack the new with venom and all their skills of rationalization. The whole social structure suffers; the young lose respect for the old; the old condemn the young; family and neighborhood solidarity weaken. The old system of treating the ill involved much cooperation on a neighborly pattern: exchanging remedies, sitting up with the sick, sending food, prayer meetings, etc. The new method weakens the drama of sickness—and even of death.

There might be still another method of dealing usefully with material of this type. Most of the data given were not collected as folklore, but entered as a natural part of conversation into the field notes of a research project which had another purpose. If such materials were collected intensively, rather than incidentally, and by people trained to understand their medical basis, and if they were analyzed fully in terms of the problems of cultural change, they should be useful to reformers, including public health officers. The public health reports available on Smalltown were only statistical, and too inadequate, statistically, to be of much use to an anthropologist. Vital statistics were given which local experience showed to be incorrect. The main facilities, doctors, hospitals, district offices, etc., were listed. Professional pride was expressed in increasing personnel and facilities, and in the increasing use of all these. Yet, there seemed to be too little knowledge of who utilized them, who did not, and why. In speaking with local physicians and health officers (except for an occasional district nurse), I heard little sympathy for, but much contempt and ridicule of,

the "native ignorance" which keeps the people who most need medical service from freely accepting diagnosis, vaccination, hospitalization, etc., when these are available, often gratis. The problem lies in the nature of resistance to change. Both social scientists and reformers would do well to study the nature of this resistance.

SECTION OF BIOLOGY

April 19 and 20, 1946

Conference on *"Some Aspects of Red Cell Production and Destruction."*

The Section of Biology held a Conference on "Some Aspects of Red Cell Production and Destruction." Doctor Eric Ponder was the Conference Chairman, in charge of the meeting.

The program consisted of the following papers:

Friday, April 19

Morning Session. Chairman, Eric Ponder, The Nassau Hospital, Mineola, N. Y.

Introduction to the Conference, by the Conference Chairman.

"Red Cell Cytochemistry and Architecture," by Eric Ponder.

"The Endocrine System and Hemopoiesis," by Albert S. Gordon and Harry A. Charipper, Department of Biology, Washington Square College of Arts and Science, New York University, New York, N. Y.

Afternoon Session. Chairman, L. Michaelis, The Rockefeller Institute for Medical Research, New York, N. Y.

"Hemoglobin and Red Cell Production in Experimental Hemorrhage Anemia," by F. S. Robscheit-Robbins, The University of Rochester, School of Medicine and Dentistry, Rochester, N. Y.

"The Iron and Porphyrin Metabolism in Relation to the Red Blood Cell," by S. Granick, The Rockefeller Institute for Medical Research, New York, N. Y.

Saturday, April 20

Chairman, W. B. Castle, Harvard Medical School, Boston, Mass.

"Etiological Considerations in Macrocytic Anemia," by W. B. Castle.

"The Hemolytic Anemias," by William Dameshek, Tufts College Medical School, Boston, Mass.

NEW MEMBERS

ELECTED APRIL 25, 1946

ACTIVE MEMBERSHIP

Beil, Carlton, Anthropology, Geology, Ecology. Teacher, Department of Education, American Museum of Natural History, New York, N. Y.

Blandino, Samuel Thomas, B.S., Biology. Microbiologist, C. D. Smith Pharmacal Company, New Brunswick, N. J.

Danielson, Irvin S., Ph.D., Biochemistry. Research Chemist, Lederle Laboratories, Inc., Pearl River, N. Y.

Dohn, Asya, M.A., Bacteriology, Microbiology. Bacteriologist, Wallerstein Laboratories, New York, N. Y.

Elias, Cloyd L., Laboratory animals. Vice President and General Manager, S & E Farms, Inc., Kingston, N. Y.

Fisher, Harold H., M.S., Biochemistry, Pharmacology. Biochemical Research, C. D. Smith Pharmacal Company, New Brunswick, N. J.

Goldfisher, Rhoda Lee, A.B., Biology. Research Histologist, Department of Pathology, University of Vermont, Burlington, Vt.

Green, James W., B.S., Physiology. Graduate Student, Department of Biology, Princeton University, Princeton, N. J.

Greenberg, Morris, M.D., Biology. Assistant Pathologist, Queens General Hospital, New York, N. Y.

Haughan, Harold W., M.S., Polymers, Plastics. Research Chemist, Cornell Aeronautical Laboratory, Buffalo, N. Y.

Hopf, Flora Paine, B.S., Education, Psychology. Teacher, Montclair Public Schools, Montclair, N. J.

Horsfall, James G., Ph.D., Botany, Microbiology. Head, Department of Botany and Plant Pathology, Connecticut Agricultural Experiment Station, New Haven, Conn.

Kraus, Hans, M.D., Medicine. Assistant in Physical Therapy, Presbyterian Hospital; Chief of Clinic, Physical Therapy, Welfare Island Hospital, New York, N. Y.

Lurie, Solomon J., D.D.S., Biology, Anthropology. Brooklyn, N. Y.

McKenzie, Doris, B.S., Bacteriology, Chemistry. Bacteriologist, Lederle Laboratories, Inc., Pearl River, N. Y.

McMillan, William G., Jr., Ph.D., Chemistry, Physics, Mathematics. Research Scientist, Carbide & Carbon Chemicals Corporation, New York, N. Y.

Maxwell, E. Mackenzie, Physics, Chemistry. Director, Domestic Sales, National Aniline Division, Allied Chemical & Dye Corporation, New York, N. Y.

Main, Rolland J., Ph.D., Physiology, Medicine. Consultant, Physiology, Eaton Laboratories; Medical Editor, Kiesewetter Agency, New York, N. Y.

Miller, James E., M.S. Assistant Professor, Meteorology, New York University, New York, N. Y.

Oster, Kurt A., M.D. Chief Pharmacologist, McKesson & Robbins, Inc., Bridgeport, Conn.

Parfentjev, I. A., Ph.D., Biology. Research Chemist, Lederle Laboratories, Inc., Pearl River, N. Y.

Rachele, Julian Richard, Ph.D., Physical Chemistry. Assistant Professor, Biochemistry, Cornell University Medical College, New York, N. Y.

Raska, Sigwin B., Ph.D., Medicine, Cardiovascular diseases. Research Associate, Dept. of Pharmacology, Cornell University Medical College, New York, N. Y.

Reid, L. Corsan, M.D., Respiration, Circulation. New York, N. Y.

Rogers, Edward F., Ph.D. Research Chemist, Merck & Company, Rahway, N. J.

Sackler, Muriel L., M.S., Biology. Graduate Student, New York, N. Y.

Spade, George O., Animal colony maintenance. President, S & E Farms, Inc., Kingston, N. Y.

Strauss, Simon, B.S., Inorganic Chemistry. Graduate Student, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

Turner, Joseph Cary, M.D., Sc.D., Hematology. Associate in Medicine, Columbia University, New York, N. Y.

Van Itallie, Philip H., M. S., Biology, Medicinal chemistry. Technical Editor of Publications, Wyeth Inc., Philadelphia, Pa.

Weisiger, James R., Ph.D., Biochemistry. Assistant Chemist, Rockefeller Institute, New York, N. Y.

Whitacre, Francis M., Ph.D., Chemistry, Biology. Director, Scientific Relations, Schieffelin & Company, New York, N. Y.

White, Harry J., Ph. D., Physics. Director, Research, Research Corporation, Bound Brook, N. J.

Wolf, Donald E., Ph.D., Organic Chemistry. Research Chemist, Merck & Company, Rahway, N. J.

ASSOCIATE MEMBERSHIP

Anderson, Donald Grigg, M.D., Infectious diseases. Dean, Boston University School of Medicine, Boston, Mass.

Applezweig, Mortimer H., B.S. Instructor, Department of Psychology, University of Denver, Denver, Colo.

Boger, William P., M.D., Endocrinology, Internal Medicine. Asst. Medical Director, Medical Research Divn., Sharp & Dohme, Inc., Glenolden, Pa.; Instructor, Medicine, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Botsford, E. Frances, Ph.D., Physiology. Associate Professor, Zoology, Connecticut College, New London, Conn.

Farner, Donald S., Ph.D., Ornithology. Assistant Professor, Zoology; Curator of Birds, University of Kansas, Lawrence, Kans.

Franzen, Dorothea, M.A., Mollusks of Kansas. Graduate Student, Department of Zoology, University of Kansas, Lawrence, Kans.

Hechter, Oscar, Ph.D., Endocrine Physiology. Associate Member, Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

Maldonado-Koerdell, Manuel, B.Sc., Morphology, Palaeontology. Graduate Student, Department of Zoology, University of Kansas, Lawrence, Kans.

Stern, Malvin D., B.S., Physical Chemistry. Graduate Student, Frick Chemical Laboratories, Princeton University, Princeton, N. J.

Swain, Ansel P., Ph.D., Biochemistry. Research Chemist, McNeil Laboratories, Inc., Philadelphia, Pa.

STUDENT MEMBERSHIP

Grantham, Jean, B.S., Chemistry. Research Assistant, Columbia University, New York, N. Y.

Shwartzman, Ella, B.A. Graduate Student, Department of Biochemistry, Columbia University, College of Physicians & Surgeons, New York, N. Y.